Introduction Recent studies demonstrated that diagnostic cerebral angiography and neuroendovascular surgical procedures can be safely and effectively performed via the transradial (TR) route. The transfemoral (TF) route is still the primary access site for most hybrid or intraoperative angiograms but there is interest to adopt the TR route. However, switching to the TR route requires a specific skill set and organizational considerations that might impede its broad application. In addition, whether the TR route is equally effective for intraoperative cerebral angiography (IOCA) for open cerebrovascular surgery requires further exploration.

Methods Between 08/2020 and 03/2022, 65 cerebrovascular procedures were performed with subsequent IOCA. Baseline demographics were retrospectively collected. In addition, times were obtained from vascular imaging (PACS). The primary outcome was the time from established vascular access to the first run of the target vessel (sheath-target time) and compared among access sites selected (TR vs. TF) and aortic arch anatomy.

Results Collectively, 65 patients (34 females, 31 males) treated for cerebral aneurysm (58.5%), arteriovenous malformation (15.4%), carotid endarterectomy (10.8%), STA-MCA bypass (7.7%), dural arteriovenous fistula (4.6%) and intraparenchymal hematoma (3.1%) were identified. The TR access was attempted in 18 patients, with one patient (5.6%) requiring conversion to a TF due to a minute proximal radial artery caliber visualized on the radial artery sheath run. The median sheath-target time for the TR access (n=17) and TF access (n=48) was 6 minutes (2 - 15) and 5 minutes (2 - 12), respectively (p=0.082). Type II/III arch configuration significantly increased median sheath-target times in the TF access group (6 vs 4 minutes in type I, p=0.013), while type II/III arch configuration did not affect sheath-target times in the TR access group (6 vs 6 minutes, p=0.838). Bovine configuration did not affect sheath-target times with either access site.

Conclusions The transradial and transfemoral access represent similar practical approaches for IOCA for various cerebrovascular pathologies. The TR access deserves certain technical and organizational aspects that can quickly be adopted. Individual anatomy dictates procedural times and requires consideration prior to selecting the optimal access site.

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E-053 A STENT-LIKE DEVICE AS A TREATMENT OPTION FOR INTRACRANIAL HEMORRHAGE: AN INITIAL STUDY

N. Gadoury, M. Phanord, A. Wakhloo, S. Koch, J. Chueh. Radiology, Lahey Hospital and Medical Center, Burlington, MA; Clinical Neurology, University of Miami, Miller School of Medicine, Miami, FL
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Introduction An intracranial hemorrhage (ICH) is a potentially deadly and debilitating disease for which there are limited effective, acute treatment options. The continuous bleeding inherent in ICH can be caused by rupture of the perforating arteries. As the bleeding expands, there is increased mortality and morbidity. The goal of this study is to build an in-vitro ICH model to test the hypothesis that a stent-like device can direct blood flow away from the perforating arteries and reduce the bleeding.

Materials and Methods The ICH model included the following components: 1.3D-printed vascular replicas, mimicking human internal carotid artery (ICA), middle cerebral artery, anterior cerebral artery (Formlabs, Somerville, MA) and lenticulostriate arteries (LSAs), 2. flow sensors (TS410, Transonics, Ithaca, NY), 3. pressure transducers (YS100, ICU Medical, San Clemente, CA), and 4. a data acquisition system (ADInstruments, Bella Vista, Australia). The LSA model had vessel branches with a diameter ranging from 400μm to 1mm, and was printed using a digital anatomy 3D printer (Stratasys Ltd, Minneapolis, MN). The fluid inside the vascular model was circulated by a pulsatile flow pump fluid and physiologically representative hemodynamics of healthy individuals was applied to the model system. The stent-like device was deployed through a 0.027” microcatheter to cover the LSAs. The flow and pressure measurements were acquired before the devices were introduced into the flow model (baseline), after device deployment and after the procedure.

Results The figure below shows the changes in LSA flow (left) and pressure (right) during the procedure. An 11% LSA flow reduction was observed after deployment of the device (baseline: 8.3±2.0ml/min vs. after device deployment: 7.4±4.8ml/min). The LSA flow returned to 8.2±4.7ml/min after the device was removed from the flow model. The LSA pressure remained the same throughout the procedure. However, the ICA pressure was elevated from 150±33mmHg (baseline) to 166±38mmHg after device deployment.

Conclusion The initial study demonstrates the potential use of a stent-like device to temporarily divert a fraction of the...
blood flow away from the bleeding perforators. Future studies will determine the optimal device design (including mesh density and porosity) that would allow sufficient blood flow reduction in the covered perforating arteries, while avoiding downstream brain ischemia.

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E-054 PULSERIDER-ASSISTED TREATMENT OF INTRACRANIAL ANEURYSMS IN THE STERLING REGISTRY

1R De Leacy, 1, A Pur, 2R Starke, 2B Jankowitz, 2A Yoo, 3F Gariel, 3S Jahshan, 3Z Kulcser, 3C Schirmer, 3C Chivot, 3J Howington, 3G Pero, 3T Yao, 3A Polilka, 3A Evans, 3O Zaidat. 1Department of Neurosurgery, Icahn School of Medicine at Mount Sinai, New York, NY; 2Department of Neurosurgery, University of Pennsylvania, Philadelphia, PA; 3Department of Neurology, Texas Stroke Institute, Plano, TX. 

Introduction PulseRider (Cerenovus, Irvine, CA) is an adjunctive neck bridging device designed to aid in coiling of wide neck bifurcation intracranial aneurysms. We present outcomes of PulseRider assisted coil embolization of brain aneurysms in routine clinical practice included in the STERLING registry.

Materials and Methods STERLING (NCT03642639) is a prospective, global registry of endovascular treatment of intracranial aneurysms with Galaxy and MicrusFrame coils (Cerenovus, Irvine, CA). PulseRider cases from STERLING were included in this interim analysis. Primary outcome measures were core-lab assessed modified Raymond-Roy (mRR) occlusion at final procedural angiogram, and where available, at 6 months (+/-3 months) or 1 year (COVID allowed window: +3 months/+1.5 years). Safety outcomes were procedure- and device-related adverse events.

Results Seventeen subjects (mean age 64.4 ± 8.69 years, 12 female) were treated with the PulseRider device. All cases were unruptured and two were retreatments of previously coiled aneurysms. All aneurysms had saccular morphology, 14/15 (93.3%) were wide neck and 13/15 (86.7%) were at a bifurcation. Target aneurysm locations included basilar artery (6/15, 40.0%), MCA bifurcation (4/15, 26.7%), ACA (3/15, 20%), ICA terminus (1/15, 6.7%), and M2 (distal to bifurcation, 1/15, 6.7%), with a mean parent vessel diameter of 2.65 ± 0.440mm. PulseRider was successfully implanted with the ability to retain the coil mass in all cases. Mean packing density was 29.7 ± 11.32%. Adequate occlusion (mRR I or II) was achieved in 86.7% (13/15) cases immediately post procedure, 100% (3/3) at 6 months, and 75% (3/4) at 1 year. There were no intra procedural ruptures, no symptomatic thromboembolic events, and no device related SAEs through the maximum follow up. 87.5% (7/8) subjects had mRS 0–2 at 1 year. There were no aneurysm retreatments.

Conclusion In this interim analysis of the ongoing STERLING registry, treatment of intracranial aneurysms with the PulseRider device in conjunction with embolization using Galaxy and MicrusFrame coils showed excellent safety outcomes and high rates of adequate occlusion and good clinical outcome.

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E-055 INTERNAL CAROTID ARTERY RECONSTRUCTION WITH FLOW DIVERTING STENTS IN THE TREATMENT OF ACUTE ISCHEMIC STROKE: TECHNICAL CONSIDERATIONS AND MEDICAL MANAGEMENT

E Orru, F Bounni, M Marosfoi, N Patel, A Walkhloo. Neurointerventional Radiology, Lahey Hospital and Medical Center, Burlington, MA

Introduction Extracranial internal carotid artery (ICA) dissections can cause stroke in a relatively young patient population. Acute endovascular reconstruction might be needed for cases with concomitant large vessel occlusion (LVO) or with a symptomatic hemispheric perfusion deficit. Tortuous cervical ICAs, often associated with dissection, might limit applicability of stiff carotid stents and require utilization of more flexible flow diverting stents (FDS). We present clinical results and technical considerations for the use of FDS in a series of patients treated for symptomatic ICA dissection.

Materials and Methods We retrospectively reviewed all cases of symptomatic ICA dissections that presented at our hospital in 24 months and reviewed technical aspects and clinical outcomes of those that underwent acute reconstruction by FDS. Results Six males (range: 37–66 years) underwent acute ICA reconstruction with FDS for treatment of a symptomatic dissection. In 3 (50%) cases the dissected segment had a complete loop. Five (80%) patients had concomitant intracranial LVO, 1 had a large area of hypoperfusion on CT imaging.